

Preliminary Amendment and Response

3215-01

Claims:

1. (currently amended) A composition comprising one or more lubricant additives in a form of a gel wherein the gel is represented by the formula $A+B+C$ wherein A is selected from the group consisting of at least one component with at least one or more reactive or associative groups; wherein B is selected from the group consisting of a particle or other component with at least one group which reacts or associates with component A to form a gel and wherein C is selected from the group consisting of at least one or more lubricant additives, and wherein the gel dissolves into the lubricating oil of a lubricating oil engine over time; and wherein the gel components are controlled released and used in an application selected from the group comprising decreasing the amount of soot in the lubricating oil engine, decreasing the amount of emissions in the engine exhaust and combinations thereof.

2. (previously presented) The composition of claim 1 wherein the gel comprises a dispersant, a detergent and an antioxidant and wherein the emissions reduced are selected from the group comprising soot, NO_x, hydrocarbons and combinations thereof.

3. (canceled)

4. (canceled)

5. (previously presented) The composition of claim 1 wherein component A is selected from the group comprising antioxidants, dispersants, succinics, maleic anhydride styrene copolymers, maleated ethylene diene monomer copolymers, surfactants, emulsifiers, functionalized derivatives of such components and combinations thereof and in the range of about 0.1% to about 95% of the gel.

6. (previously presented) The composition of claim 1 wherein component B is selected from the group comprising dispersants, detergents, overbased detergents, carbon black, silica, alumina, titania, magnesium oxide, calcium carbonate, lime, clay, zeolites and combinations thereof and in the range of about 0.1 % of about 99% of the gel.

Preliminary Amendment and Response

7. (previously presented) The composition of claim 1 wherein component C is selected from the group comprising antioxidants, extreme pressure agents, wear reduction agents, viscosity index improvers, anti-foaming agents and combinations thereof and is in the range of about 0% to about 95% of the gel.

8. (original) The composition of claim 1 wherein the gel comprises an overbased detergent and an ashless succinimide dispersant and wherein the ratio of detergent to dispersant is of about 10:1 to about 1:10.

9. (original) The composition of claim 8 wherein the total base number (TNB) of the overbased detergent is in the range from about 100 to about 400.

10. (original) The composition of claim 2 when the dispersant is selected from the group comprising ashless succinimide, polyisobutenyl succinimide, substituted long chain alkenyl succinimides, high molecular weight esters, mannich dispersants, N-substituted long chain alkenyl succinimides, carboxylic dispersants, amine dispersants, polymeric dispersants, decyl methacrylate, vinyl decyl ether, aminoalkyl acrylates, acrylamides, poly-(oxyethylene)-substituted acrylates, high molecular weight olefins with monomers containing polar substitutes and a mixtures thereof; and a detergent selected from the group comprising overbased sulfonates, phenates, salicylates, carboxylates, overbased calcium sulfonate detergents, overbased detergents containing metals such as Mg, Ba, Sr, Na, Ca and K and mixtures thereof; and an antioxidant selected from the group comprises alkyl-substituted phenols, 2, 6-di-tertiary butyl-4-methyl phenol, phenate sulfides, phosphosulfurized terpenes, sulfurized esters, aromatic amines, diphenyl amines, alkylated diphenyl amines, hindered phenols, bis-nonylated diphenylamine, nonyl diphenylamine, octyl diphenylamine, bis-octylated diphenylamine, bis-decylated diphenylamine, decyl diphenylamine, 2,6-di-tert-butylphenol, 4-methyl-2,6-di-tert-butylphenol, 4-ethyl-2,6-di-tert-butylphenol, 4-propyl-2,6-di-tert-butylphenol, 4-butyl-2,6-di-tert-butylphenol, 2,6-di-tert-butylphenol, 4-pentyl-2,6-di-tert-butylphenol, 4-hexyl-2,6-di-tert-butylphenol, 4-heptyl-2,6-di-tert-butylphenol, 4-(2-ethylhexyl)-2,6-di-tert-butylphenol, 4-octyl-2,6-di-tert-butylphenol, 4-nonyl-2,6-di-tert-butylphenol, 4-decyl-2,6-di-tert-butylphenol, 4-undecyl-2,6-di-tert-butylphenol, 4-dodecyl-2,6-di-tert-butylphenol, 4-tridecyl-2,6-di-tert-butylphenol, 4-tetradecyl-2,6-di-tert-butylphenol, 4,4'-methylenebis(6-tert-butyl-o-cresol), 4,4'-

Preliminary Amendment and Response

methylenebis(2-tert-amyl-o-cresol), 2,2'-methylenebis(4-methyl-6-tert-butylphenol), 4,4'-methylene-bis(2,6-di-tertbutylphenol) and mixtures thereof. .

11. (previously presented) A process comprising contacting a portion of the engine oil with a gel of the composition of claim 1 resulting in the reduction of soot in the engine oil and/or emissions in an engine exhaust.

12. (original) The process of claim 11 wherein the gel is positioned to contact the oil in an area selected from the group comprising full flow oil, bypass of oil, in the reservoir and combinations thereof.

13. (original) The process of claim 11 wherein the gel is located in an area selected from the group comprising a filter, a drain pan, an oil bypass loop, a canister, a housing, a reservoir, a pocket of a filter, a canister in a filter, a mesh in a filter, a canister in a bypass system, a mesh in a bypass system and combinations thereof.

14. (original) The process of claim 11 wherein the gel is in contact with the engine oil in the range of about 100% to 5% of the engine oil.

15. (original) The process of claim 11 wherein the gel is positioned in a location of flow rate of the engine oil in the range of greater than 1% to about 100% of the circulating engine oil.

16. (original) The process of claim 11 wherein the gel at the end of its service life contains a range of none to a portion of the components in the gel remaining at the end of the service life of the gel due to selective dissolution of the gel.

17. (original) The process of claim 11 wherein the emissions reduced in the exhaust are selected from the group comprising soot, Nox, hydrocarbons and combinations thereof. 18. (original) The process of claim 11 comprising adding to the engine oil at the same time all or a portion of the components of the gel.

19. (original) The process of claim 11 comprising adding to the engine oil w the components of the gel in portions to the engine oil over its service life.

20. (original) The process of claim 11 comprising adding to the engine oil the components continuously to the engine oil over the service life of the oil.

Preliminary Amendment and Response

21. (original) A process comprising contacting a portion of the engine oil with a gel of the composition of claim 2 resulting in the reduction of soot in the engine oil and/or emissions in an engine exhaust.

22. (original) A process comprising adding to the engine oil all or a portion of the components of the composition of claim 1 resulting in the reduction of soot in the engine oil and/or emission in an engine exhaust.

23. (previously presented) An oil filter for an engine oil lubricating system comprising a housing, a filter for removing particulate matter from an oil bypass filter and a container with a soot-reducing gel wherein the gel comprises a dispersant, a detergent, an antioxidant and combinations thereof and results in the reduction of one of the following selected from the group consisting of an engine soot, emission and combinations thereof.

24. (original) A gel containment device for an engine oil lubricating system comprising a housing and a container with a gel, and wherein the gel comprises a dispersant, a detergent, an antioxidant and combinations thereof for the soot reduction, emissions reduction or combinations thereof of an engine.

25. (New) A composition comprising two or more lubricant additives in a form of a semi-solid gel, wherein the gel is represented by the formula $A+B+C$, wherein the components A and B interact to form a gel and component C is contained within the gel; wherein component A is selected from the group comprising antioxidants, dispersants, succinics, maleic anhydride styrene copolymers, maleated ethylene diene monomer copolymers, surfactants, emulsifiers, functionalized derivatives of such components and combinations thereof; wherein component B is selected from the group comprising dispersants, detergents, overbased detergents, carbon black, silica, alumina, titania, magnesium oxide, calcium carbonate, lime, clay, zeolites and combinations thereof; wherein component C is selected from the group consisting essentially of antioxidants, extreme pressure agents, wear reduction agents, viscosity index improvers, anti-foaming agents and combinations thereof; wherein the gel components are controlled released during engine operation resulting in a decrease in the amount of soot in the lubricating oil engine, a decrease in the amount of emissions in the engine exhaust, and combinations thereof.